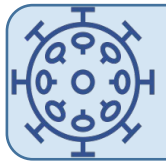
CHAIR FOR CLINICAL BIOINFORMATICS
SAARLAND UNIVERSITY

PRO-/SEMINAR: BIOMEDICAL IMAGE ANALYSIS



Covid-19 Edition:
No Recording! Remote only.

M.Sc. Georges Schmartz
s8geschm@stud.uni-saarland.de

16/12/2021

FOR CLARIFICATION:

CHAIR FOR CLINICAL BIOINFORMATICS
SAARLAND UNIVERSITY

- Seminar (Master‘s only, 7 CPs - graded)
- Proseminar (Bachelor‘s only, 5 CPs – graded)
- **All talks** will be held in english language!

ABOUT THIS COURSE

- What?
  - DICOM/ CT/ MRA/ MRI/ PET SCAN/ X-ray
- Why?
  - Non-invasive diagnostics
  - Rich information content
  - Recent technological progress
- How?
  - Neural networks
  - Histogram analysis
  - Digital filtering

DISTRIBUTED TOPICS

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	Student	Topic	
Proseminar	Lisa Stillenmunkes	3	Deep-COVID: Predicting COVID-19 from chest X-ray images using deep transfer learning
Seminar	Amila Beganovic	5	Detecting Branching Nodes of Multiply Connected 3D Structures
	Tanya Malkani	6	Fuzzy Gray Level Difference Histogram Equalization for Medical Image Enhancement
	Alper Yurtseven	7	A CT-Based Automated Algorithm for Airway Segmentation Using Freeze-and-Grow Propagation and Deep Learning
	Muhammad Saqlain Jaffar	8	Fully Automated Lung Lobe Segmentation in Volumetric Chest CT with 3D U-Net: Validation with Intra- and Extra-Datasets
	Dino Milanovic	9	3D Dense Separated Convolution Module for Volumetric Medical Image Analysis
	Sara Elmeligy	10	Accurate brain age prediction with lightweight deep neural networks
	Liubov Shilova	11	Medical image analysis using wavelet transform and deep belief networks
	Abdul Basit	12	Integrating spatial configuration into heatmap regression based CNNs for landmark localization

COURSE SCHEDULE

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Event	Time	Comments
Registration	29.11.2021 - 05.12.2021	
Kick-off meeting [mandatory]	Today (14.12.2021)	Remote
Deadline to register in HISPOS OR de-register from seminar [mandatory]	13.01.2022	3 weeks after the kick-off meeting
Deadline for feedback [optional]	15.02.2022	1 weeks before the presentations
Presentations	01.03.2022	Remote (Microsoft Teams)
Summary submission deadline	08.03.2022	1 week after the presentations

HOW TO PASS THE COURSE

Certificate requirements:

1. Successful presentation:
   - Talk: **30 minutes** for a Proseminar and **40 minutes** for a Seminar
   - Discussion: **5 minutes** during which you should be able to answer questions from the tutors/audience
2. Attendance to all presentations is **mandatory**
3. Submitting a summary report:
   - Short description of the presented topic(s)
   - Ca. 2 pages of text, excluding title (page), references, figures, tables etc..
   - No figures, tables or formulas required
   - Main structure: title page, main text (with or without subsections), references
   - It is recommended to write the report using LaTeX to train scientific writing

Final grade:

- Primarily based on the given presentation & follow-up discussion
- Might be influenced by the quality of the submitted summary report

Most importantly:

Practice!

But also:

- Try to reduce the amount of text
  - prevent showing entire sentences
  - use figures or visualizations provided by the literature
- Rule of thumb:
  you should be able to explain everything that’s shown on your slides
- Proof-read your slides
- Speak freely and do not use cheat sheets

We expect you to:

- Read our presentation guidelines:
  https://www.ccb.uni-saarland.de/wp-content/uploads/2017/01/guidelines.pdf
- Fill-out and send the presentation checklist along with your slides:
  https://www.ccb.uni-saarland.de/wp-content/uploads/2014/09/presentation_guidelines.pdf
- Ask for feedback or formulate questions whenever you are stuck
- Independently use the available literature to enhance your knowledge on the assigned topic
  - *See also our **recommended reading** literature on the course site!*

HOW TO FAIL THE COURSE

Don’t:

- Show formulas that you cannot elaborate further
- Rely only on visualizations from the paper
  - Use e.g. Inkscape to draw own figures
- Change layouts / formatting too often
- Send us half finished slides for feedback and be surprised that the missing slides are bad
- Deviate from your time constraint
- Send us a large list of questions
- Ignore the recommended literature
- Forget to provide references
- Assume a superficial understanding suffices

SPECIFICALLY FOR THIS SEMINAR

You may assume the audience knows the following basics:

- Neural networks:
  - Autoencoder
  - Convolutional neural network
  - Sigmoid
  - (Leaky) ReLU
  - Backpropagation